and promote services and/or treatments. This study can also help to assess the cost-benefit ratio of folic acid supplementation and the cost-benefit ratio of recommended food supplements.

PMS25

MEDICAL RESOURCE UTILIZATION AND WORKDAYS LOST IN PATIENTS WITH FIBROMYALGIA

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OBJECTIVES: Fibromyalgia or fibromyalgia syndrome (FMS) is characterized by chronic widespread muscular pain and generalized tender points, often accompanied by a number of associated symptoms such as fatigue, sleep disturbance, psychological distress. The objective of this study was to assess the medical resource utilization (MRU) and workdays lost (WDL) of FMS patients according to the level of pain and fatigue. **METHODS:** The Adelphi Fibromyalgia Disease Specific Programme is a cross-sectional survey among 2159 FMS patients in France, Germany, Italy, Spain and the UK. The survey included one questionnaire filled in by the patient and one by the physician. Patient health states were defined on the basis of items 15 and 16 (100 mm VAS scales) of FIQ (Fibromyalgia Impact Questionnaire). **RESULTS:** From the pool of 2159 FMS patients, most patients with moderate pain (80.5%) or severe pain (95.5%) also suffered from fatigue. A total of 1341 patients had significant fatigue (cut off: 50 mm), associated with mild (<40 mm; N = 154), moderate (40–70 mm; N = 587) or severe (>70 mm; N = 600) pain. The annual number of physician visits per patient (5.71, 6.14 and 7.47 respectively), co-medication costs per 4 weeks (£3.66, £5.48 and £8.11), as well as the annual hospitalisation rate (2.6%, 5.6% and 7.5%) and length of stay per patient per year (0.42, 1.69 and 1.95 days, respectively) increased following the level of pain. Similarly, the percentage of patients on sick leave and its duration were larger in patients with fatigue and moderate (11.9% and 40 weeks) or severe (20.0% and 44 weeks) pain, compared to patients with mild pain (8.4% and 33 weeks). **CONCLUSIONS:** In patients with FMS who present with significant fatigue, medical resource utilization and workdays lost are driven by the level of pain.

PMS26

HEALTH CARE RESOURCES AND COSTS OF FIBROMYALGIA: A REVIEW OF THE EVIDENCE

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OBJECTIVES: This review was performed to document and analyse the evolution of costs in Fibromyalgia (FM). **METHODS:** A systematic review (SR) was performed using Mesh terms (Medline 1980–2009). Articles on FM were selected if they presented direct or indirect costs. Two researchers extracted costs which were divided by type of resource. Total direct costs were divided by health care visits, hospitalization, procedures and drug costs; and, indirect costs in two types: absenteeism or work with reduced productivity. Costs were compared and differences were documented. Trends analysis was performed after converting results to USD$. **RESULTS:** Out of 28 citations, 7 articles were included. Four papers reported costs in USD$, 2 in Euros and 1 in CA$. Costs were reported /patient/year, except for the Canadian 6-month study. All studies identified total direct costs, disaggregated in subtypes by 6 of them. Five studies reported total indirect costs; 3/5 reported on absenteeism and on reduced productivity. Three US studies were performed before 2000, and one in 2005. There was a progression in total direct costs/patient/yr from 1996 to 2005 from USD$2274 to USD$7286 respectively and for total indirect costs, from USD$1010 to USD$2913. Two European analyses provided similar total direct costs/patient/yr, but did not report on the same indirect costs. The 6-month results were excluded from the primary trend analysis. A slope of $y = 1990x$ and $R^2 = 0.83$ was obtained, showing a reliable increasing trend. Including the 6-month analysis (multiplied by 2), results changed to $y = 1881x$, $R^2 = 0.64$. **CONCLUSIONS:** This SR and trend analysis documented two major categories and subtypes of costs reported for FM, and detected an increasing trend. Limitations arose from adjusting indirect costs in two studies and the inclusion of papers from various settings. Further detailed analyses, including costs of comorbidities and premature death, are warranted to establish the full economic impact of FM.

PMS27

DIRECT AND INDIRECT COSTS OF RHEUMATOID ARTHRITIS MANAGEMENT IN POLAND

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OBJECTIVES: The purpose of this analysis was to assess the direct and indirect costs of rheumatoid arthritis (RA) treatment in Poland in the years 2003–2007. **METHODS:** In order to estimate the direct medical costs of RA, including the costs of medical consultation, hospitalization, rehabilitation, drugs and diagnostic tests, data for the years 2004–2007 of the National Health Fund were used. Indirect costs like costs of pensions for incapacity for work, the costs of rehabilitation and social costs of rents for the years 2003–2007 were obtained from the Department of Social Security. **RESULTS:** Direct medical costs of RA in Poland ranged from 115.7 million pln in 2004 to 126.5 million pln in 2007. Costs of hospital treatment amounted up to 70% of the direct costs in 2007. Indirect costs amounted to almost 60 million pln in 2003 and rose to over 62 million pln in 2007. The largest share of these costs constitute the costs of pensions for incapacity for work, which share in indirect costs was 83% in 2007. Costs of rehabilitation were increasing in subsequent years (from around 4 million in 2003 to 9.7 million pln in 2007). The total cost of treatment of RA showed an upward trend, reaching a value almost 177 million pln in 2004 and increased to almost 188 million pln in 2007. The total cost was dominated by the direct costs with share equal to 65% in 2004 to 66.8% in 2007 of the total costs. **CONCLUSIONS:** From year to year RA causes a growing economic burden on the health care and social insurance in Poland. The cost structure is dominated by the direct costs, which in turn largely consist of the costs of hospital treatment. Indirect costs are affected largely by rents due to the inability to work.

PMS28

COSTS AVOIDED BY DIAGNOSING FIBROMYALGIA

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OBJECTIVES: To estimate the costs savings in outpatient medical resource use associated with diagnosing fibromyalgia during the four years after diagnosis in five European countries (UK, France, Italy, Spain, Germany). **METHODS:** The UK resource use data were extracted from medical records of 2,260 patients diagnosed with FM between 1998 and 2003 in the General Practice Research Database (GPRD). For the others countries, a questionnaire was created based on the UK data and local experts, GP and rheumatologists, were asked to compare their own clinical practice to UK prescriptions in terms of tests, drugs, general practitioners and specialists visits, over a period of –4 years before diagnosis to +4 years after the diagnosis. Medical resource use if diagnosis would not have been established was predicted using adapted published Poisson loglinear regression models. The observed and predicted trends in outpatient resource use and costs were calculated, so the impact of diagnosis could be evaluated for each of these medical resources. **RESULTS:** In the five countries studied, whereas costs are increasing during the years till diagnosis (+40–72% in 4 years, €394€ per patient the year of diagnosis from the health care perspective in Italy to €2108 in Germany), after diagnosis a decrease is observed (5–10%). Compared to a diagnosed FM patient, a non-diagnosed patient represents an incremental cost that ranges between 97€ (Italy) and €421€ (Spain) per patient and per year from the health care payer perspective. These higher costs are due to more GP and specialist visits and diagnostic tests. An earlier diagnosis allows from the societal perspective savings ranged from 106€ (Italy) to €432 (Spain) per patient and per year. **CONCLUSIONS:** Making the diagnosis of FM reduces costs gradually independent of the country studied.

PMS29

HEALTH ECONOMIC COMPARISON OF OUTPATIENT MANAGEMENT OF FIBROMYALGIA BEFORE AND AFTER DIAGNOSIS IN FIVE EUROPEAN COUNTRIES

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OBJECTIVES: To compare the resource use and related costs associated with the management of fibromyalgia (FM) in five European countries (UK, France, Italy, Spain, Germany). **METHODS:** The UK resource use data were extracted from medical records of 2,260 patients diagnosed with FM between 1998 and 2003 in the General Practice Research Database (GPRD). For the other countries, a questionnaire was created based on the UK data and local experts, GP and rheumatologists, were asked to compare their own clinical practice to UK prescriptions in terms of tests, drugs, general practitioners and specialists visits, over a period of –4 years before diagnosis to +4 years after the diagnosis. Information on paramedical and alternative care was also collected for France, Italy, Spain, Germany. Inpatient care and productivity loss were not included in GPRD and thus also not in the questionnaire. The public payer and societal perspective were used. **RESULTS:** Resource use and average costs related to lab tests per person-year from the public health care payer perspective were highest in Spain (101€) and the UK, the year of diagnosis and decrease afterwards (€69 in Spain). Drug costs are higher in Germany (€242€) mainly due to the higher unit costs. Costs related to GP visits increase till diagnosis in Germany (€892) and the UK. The costs for referrals to specialists are the highest before diagnosis in the UK (€131), France, and Italy. Overall, the highest mean annual total cost per patient from the societal perspective was found in Germany (€1,897), the lowest in Italy (€454). The highest patient contribution was seen in France (54%), the lowest in Italy (16%). **CONCLUSIONS:** Although moderate differences between countries were found in the management of FM, once a formal FM diagnosis was made, the resource use and costs decreased independent of the countries studied.

PMS30

COST ANALYSIS OF BALLOON KYPHOPLASTY VERSUS NON SURGICAL MANAGEMENT FOR OSTEOPOROTIC VERTEBRAL FRACTURES IN GERMANY

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OBJECTIVES: Balloon kyphoplasty (BKP) is a minimally invasive procedure for the treatment of painful vertebral compression fractures (VCFs). Superior clinical outcomes data versus non surgical management (NSM) has recently been demonstrated in a large RCT comparing BKP and VCF. Furthermore, preliminary results of a large

retrospective US medicare claim base data analysis have been shown to significantly decrease mortality risk of a VCF patient when treated with BKP compared to NSM. Aim of this study is the evaluation of resource usage and costs for treatment of BKP patients in comparison to NSM patients from a social insurance perspective. **METHODS:** In this prospective, non-randomised follow-up-study treatment and costs were evaluated in 8 study centers in Germany between 2005 and 2008. Data was recorded by questionnaires at baseline and by phone at follow-up. Resource usage was valued by DRG for inpatient treatment, EBM fur outpatient treatment and Lauer-taxe for medication. **RESULTS:** The higher initial DRG treatment costs in the BKP arm are partially off-set by lower follow-up costs (Follow-up DRG costs: BKP: €131.08; NSM: €1149.75; Mann-Whitney-U: p = 0.006; Outpatient treatment: BKP: €860.57; NSM: €991.65; Mann-Whitney-U: p = 0,300; Medication: BKP: €136.56; NSM: €338.42; Mann-Whitney-U: p = 0.007). Total costs for the BKP patients were € 3,874.12 higher than for the NSM patients (Mann-Whitney-U: p = 0.000). Compared to NSM, BKP treated patients had significantly shorter hospital stay for both the initial and follow-up hospitalization (9.6 versus 14.7, p = 0.000 and in follow-up hospitalization 10.7 versus 17.7, p = 0.005). **CONCLUSIONS:** The higher baseline costs of BKP versus NSM are partially off-set by reduced follow-up treatment costs. The remaining additional costs have to be weighted against shorter hospital stay and improved clinical outcomes. Full economic evaluations of BKP versus NSM in the UK, Italy and Spain have already demonstrated the cost-effectiveness of BKP versus NSM.

PMS31

COST OF TREATMENT COMPARISON OF TNF-α INHIBITORS FOR THE TREATMENT OF RHEUMATOID ARTHRITIS IN SOUTH AFRICA

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OBJECTIVES: TNF-α inhibitors are becoming a widely used treatment option for rheumatoid arthritis (RA) in the South African private sector. Justification for reimbursement decisions range from pure list price comparisons to cost of treatment comparisons, with limited use of health economics, since South African private health care funders have a developing understanding of health economics. The objective of this cost of treatment comparison is to estimate the total direct medical costs associated with the use of TNF-α inhibitors for the treatment of RA in the South African private sector. **METHODS:** This analysis compares the cost of treatment using the results of the DART dose escalation study comparing etanercept, adalimumab and infliximab. The expected direct medical costs were estimated over a one year period under two scenarios (dose escalation and no dose escalation) and included the costs of TNF-α inhibitors, administration, consultation and dispensing. The scenario excluding dose escalation was based on minimum label dose and the dose escalation scenario was based on 12 months of actual dosing of each TNF-α inhibitor from the DART data. Cost values were estimated from the perspective of the South African private health care funder. **RESULTS:** Total direct medical costs associated with the use of etanercept, adalimumab and infliximab are respectively R118,235, R118,357 and R121,481 per person based on the DART dose escalation study. The cost associated with adalimumab is 5% lower compared with etanercept and infliximab when the effect of dose escalation is not taken into account. The total cost of treatment for the total population of private sector RA patients using TNF-α inhibitors is 77 million ZAR (€6.9 million). **CONCLUSIONS:** The direct medical costs associated with the use of TNF-α inhibitors for the treatment of RA patients in South Africa are similar despite the differences in list prices of these agents.

PMS32

ASSESSMENT OF THE TOTAL DIRECT MEDICAL COST OF PATIENTS IN SECOND-LINE TNF INHIBITOR THERAPY AND OF THE RESPECT OF CLINICAL PRACTICE RECOMMENDATIONS

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OBJECTIVES: To establish the total direct medical cost of patients in second-line TNF a therapy from the French heath care system perspective. **METHODS:** A multicentre observational study was conducted, recruiting patients treated since at least four months by a second TNF a therapy. The sample represented was assessed through the comparison of the regional allocation of inclusions to the regional allocation of TNF a prescriptions issued from a national panel. Inpatient and outpatient consumptions were collected retrospectively, for the preceding four months. Respect of clinical practice recommendations was assessed through the analysis of administration frequencies and posologies. **RESULTS:** Fifty-nine hospital centres participated in the study, including 277 patients. The sample could be considered as representative as the correlation between the regional activity in terms of TNF a prescriptions and the number of included patients per region was high (r = 0.88). The resulting total annual direct medical cost equalled €16,000 per patient. Respectively 43, 132, and 102 patients were included in the INF, ETA and ADA groups. Two patients treated by INF received more than the expected number of administrations, whereas 8 others had a higher dosage than that recommended. Respectively 11.4% and 24.5% of patients treated by ETA and ADA also received more administrations than expected during the 4 months of treatment. **CONCLUSIONS:** This representative study stated that hospitalisation costs represented 92% of the total direct medical costs of patients treated by a second-line TNF a therapy, reaching €16,000 per patient and per year. In the absence of a specific market authorisation in the indication, TNF a therapies are prescribed, but the clinical practice recommendations are not always respected.

PMS33

COST-BENEFIT ANALYSIS OF MANAGEMENT STRATEGIES TO REDUCE ROAD TRAFFIC INJURIES

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OBJECTIVES: to examine the cost-benefit of management strategies for reducing road traffic injuries. **METHODS:** The study was a cross-sectional analysis of secondary data retrieved from the Injury Surveillance (IS) in the fiscal year 2004 to 2006. The sample consisted of all traffic accidental patients who received hospital emergency services. The two dependent variables used were direct medical cost and death, multiple linear regression models and binary logistic regression models were constructed. The outputs of management strategies: non-use of crash helmets and drunk driving were explained by using Monte Carlo technique. **RESULTS:** The study covered 12,651 patients. For the regression analysis, statistically significant predictors were composed of sex, age, drunk driving, non-use of crash helmets, accidental timing, victim and severity (adjusted $R^2 = 0.60$). For the binary logistic regression analysis, odd-ratio of the causes of death of non-use of safety equipments (helmet and seatbelt) and drunk driving were 3.56 (CI 2.62–4.85) and 1.24 (CI 1.01–1.53) respectively. The direct medical cost arrived at from using the regression model when using law enforcement with 50 percent succession of both strategies was THB20,983,413.59. Compare with the current situation, it was THB26,709,449.76 (21.44% save). In the same way, the net benefit gain from these enforcement was THB512,894,977.48. (58.44% save). Nevertheless, changing each assumption of the successful management strategies from 10% to 50%, the sensitivity analysis shows the range of saving from 24.67% to 58.44% and the benefit to cost ratio was 10.81. **CONCLUSIONS:** These findings show the scenario to reduce traffic injury, the law enforcement strategies for using safety equipment and reduce the number drunk driving is a useful management tool to reduce cost of illness nearly three-quarters of the damages from road traffic injuries.

PMS35

COST-EFFECTIVENESS OF BIOLOGIC THERAPEUTIC SEQUENCES FOR RHEUMATOID ARTHRITIS IN THE UK

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OBJECTIVES: Biologic agents are commonly used sequentially to treat moderate to severe rheumatoid arthritis (RA). In absence of clinical trials comparing biologic strategies, simulation models are useful to inform decisions. The objective is to assess, using the NHS perspective, the cost-effectiveness of biologic strategies in patients with an insufficient response (IR) to at least 1 anti-TNF agent. **METHODS:** Simulation models were developed to assess four strategies of different biologic agents over 2 years. Assuming an IR to the 1st anti-TNF agent, Sequence 1 included etanercept-abatacept-adalimumab and Sequence 2 etanercept-rituximab-adalimumab. Assuming an IR to 2 anti-TNF agents, Sequence 3 included etanercept-adalimumab-abatacept and Sequence 4 etanercept-adalimumab-infliximab. Effectiveness data was derived from published evidence based on achieving a low disease activity state (LDAS). Switch occurred at each 6 months in case of an IR to the previous agent. UK direct medical costs and biologic drug costs were used. Extensive probabilistic sensitivity analyses were performed. **RESULTS:** There were 6-month medical costs (excluding biologic drug costs) were estimated at £1047 (Standard Deviation [SD] 332) for managing patients in LDAS and at £2650 (SD 963) for moderate-to-high disease activity. Over 2 years, Sequence 1 appeared more efficacious (92 days in LDAS) versus Sequence 2 (82 days in LDAS,) with cost-effectiveness ratios of £281/day in LDAS vs. £289/day in LDAS, respectively. Sequence 3 appeared more efficacious (43 days in LDAS or) vs. Sequence 4 (32 days in LDAS), with cost-effectiveness ratios of £603/day in LDAS vs. £809/day in LDAS, respectively. **CONCLUSIONS:** Medical costs associated with moderate-to-high disease activity are estimated to be 2.5 times higher than for LDAS, suggesting that efficacious treatment strategies contribute to reducing use of health care services. The results of this simulation model suggest that, for achieving LDAS, sequences including abatacept after an IR to at least 1 anti-TNF agent appear more cost-effective than similar sequences including rtx or cycled anti-TNF agents.

PMS36

COST-EFFECTIVENESS OF ZOLEDRONIC ACID ONCE-YEARLY INFUSION IN THE PREVENTION OF POSTMENOPAUSAL OSTEOPOROTIC FRACTURES BASED ON COMPLIANCE AND NUMBER NEEDED TO TREAT APPROACH IN THE TURKISH HEALTH CARE SETTING

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OBJECTIVES: Several studies have demonstrated that compliant and long-term use of bisphosphonates is necessary to realize full benefits of treatment. In particular, a progressive relation between compliance (medication possession ratio above 80%) and fracture risk reduction has been found (Siris, Mayo Clin Proc 2006;81:1013–22 and Penning, Osteoporos Int 2008;19:511–17). Taking into account patient compliance, we compared the effectiveness and costs of zoledronic acid (ZOL) versus weekly alendronate & risedronate and monthly ibandronate therapies over 3 years in the prevention of postmenopausal osteoporotic fractures from the NHS perspective of Turkey, using Number Needed to Treat (NNT) approach. **METHODS:** NNT values